over the cited art and respectfully request reconsideration.

Claim 13 was rejected over Rees. Referring to Figure 4 of the drawings, Claim 13 requires affixing a first pre-cured assembly 12 to a 3D woven textile pre-form 14 impregnated with an uncured resin, an adhesive film 16 being located between the first pre-cured assembly and the pre-form. The claim also requires affixing an additional pre-cured assembly 12 to the pre-form 14 with an additional adhesive film 16 between them. The claim then requires curing the resin and adhesive films to form a structural assembly.

Rees discloses upper and lower mouldings 11 and 12 that are pre-cured and have machined surfaces 14 and 17 coated with a heat-hardenable adhesive (column 10, lines 35-37). The adhesive could also be heat-hardenable resin in conjunction with thermosetting plastic resin (column 2, lines 42-43). Electrical conductors 20-26 are located within the layer of heat-hardenable adhesive. Mouldings 14, 17 are then brought together under pressure (column 3, lines 11 and 12). Electrical current is provided to conductors 20-26 to apply heat. In example 1, although the words "adhesive processes" are employed at column 2, line 42, the patent does not say that a woven textile impregnated with a heat hardenable resin is used in conjunction with an adhesive film.

In example 2 of Rees, electrical conductors 21-26 are formed in a solid film material of heat hardenable resin (column 3, lines 28-32). Column 4, lines 45-50 states that the solid film comprises two sheets of thin felted or woven fibrous materials impregnated and stuck together with a partially cured water soluble phenol resin and the electrical conductors between them. Column 3, lines 37-40 indicates that this solid film is used to join the mouldings in a known adhesive process.

Applicant cannot find any mention in the patent that the solid film containing the conductors is used in conjunction with an adhesive film. The resin within the sheets of thin felted or woven fibrous materials is used to bond the two mouldings together. The specification at column 1, lines 53-58 states that a heat hardenable adhesive and an electrical conductor are placed between the fully cured heat hardened composites. There is no mention at any point of a woven textile pre-form that is impregnated with resin and cured in combination with an adhesive film. Rather it appears that the

word "adhesive" is used interchangeably with resin.

Claim 13 requires a first adhesive film located between the woven textile pre-form and the first pre-cured assembly, and a second adhesive film located between the pre-form and a second pre-cured assembly. Applicant submits that Rees does not suggest films of adhesives in conjunction with a pre-form that is impregnated with an uncured resin. Rather, example 2 of Rees suggests only resin infused sheets of a fibrous material with electrical conductors sandwiched between. Furthermore, Applicant submits that Rees does not suggest a 3-D pre-form, which is a pre-form woven in multiple layers. Applicant submits that the woven fibrous material (mentioned in column 3 lines 45-50), comprises two separate sheets, each being of a single layer, thus the pre-form is two dimensional.

Claims 15, 16, 19 and 20 depend from claim 13, thus should also be allowed. Claims 19 and 20 depend from Claim 13, thus should be allowed. Claim 20 requires an over-wrap ply on an exterior portion of the pre-form that is not located between the pre-cured assemblies. Over-wrapped plies 28 are shown in Figure 9, and shown to overlie the external surfaces of pre-form 14.

In Rees, there are no surfaces of the solid film outside of those located between the pre-cured mouldings. The fibrous woven sheets that sandwich the electrical conductors are located only between the two mouldings for bonding the two mouldings. There would be no over-wrapped plies because there are no exterior portions as required by Claim 20.

Claim 23 depends from Claim 13, requiring that the pre-form have a base and a leg extending from the base at an angle relative to the base. Figure 9 shows two legs, and the embodiment in Figure 7c shows a single leg. Rees suggests only a flat thin pre-form comprising two layers of fabric with conductors between them, all located in a single plane. Rees does not suggest a leg extending from a base at an angle.

Claim 24, the second independent claim, requires providing a woven textile pre-form with a base and at least one leg extending from the base at an angle. The solid film of Rees does not have a base and a leg extending at an angle, rather it is located in a single plane. Claim 24 also requires

adhesive films in addition to the resin impregnated pre-form. Claim 24 requires that one of the structures is located in contact with the leg and the other in contact with the base. Applicant submits that this claim should be allowed.

Claim 32 requires at least one fiber woven through an intersection of the base and the leg. There is no such in Rees. Claim 45 requires a tapered thickness at the pre-form at an edge of an exterior surface of the pre-form. In Figure 4, the tapered edges are shown at the side edges of the base and the free ends of the legs. The tapered surfaces blend the pre-form with the pre-cured assemblies, reducing the chances for de-lamination. Rees does not suggest tapering any thickness of the pre-form. Rees does not suggest any exterior surfaces.

Claim 17 was rejected over Rees in view of Scott. Claim 17 depends from Claim 16, stating that the pressure is applied by a pressure intensifier that is located in contact with an exterior surface of the pre-form, the pressure intensifier pressing the exterior surface against a portion of one of the pre-cured assemblies. Figure 4 shows pressure intensifiers 18 that press against the exterior corner surfaces of pre-form 14.

Scott shows a pressure equalizing sheet 24 that applies pressure to a pressing strip 22, which in turn applies pressure to wire turns 21 that are being molded into a card 11. Sheet 24 is located between two halves of a die. If Scott is applied to Rees, the suggestion would be to use a pressure sheet located between the two pre-cured mouldings 11 and 12. However, that would not be feasible because it would result in the pressure sheet being left in place after the structure is completed. Since Rees deals with pressing two pre-cured mouldings 11 and 12 together, Applicant cannot determine how Scott's equalizing sheet 24 can be combined with Rees other than locating it between the two mouldings. There is no exterior surface of the solid film in Rees outside of the two mouldings, rather the entire solid film is located between the abutting surfaces of upper and lower mouldings 11 and 12. Applicant submits that Claim 17 should be allowed.

Claim 21 states that the pre-curing is formed by placing a pressure-intensifier against an exterior surface of the pre-form that is not located between the pre-cured assemblies, placing the

assemblies in a vacuum bag, then evacuating the bag to cause the pressure-intensifier to press the exterior surface of the pre-form against a portion of one of the pre-cured assemblies. Again, Scott shows a pressure-equalizing blanket between two halves of a die. Scott does not show how this can be employed in Rees because the solid film of Rees does not have any exterior surfaces.

Scott does not disclose using a vacuum to apply pressure. In connection with claim 18, the examiner stated that Bascom discloses that it is known to employ a vacuum in conjunction with a lamination process. Bascom discloses a process in Figures 1a-1c wherein an adhesive layer 12 bonds to a surface 14. Adhesive layer 12 is a semi-rigid sheet of adhesive supported by a loose-weave nylon or plastic cloth (page 1, line 20). Lines 19-24 of page 1 discusses the prior art, stating that bonded assemblies are placed in bags, a vacuum is pulled on the bag to hold the assemblies together, then the bag assembly is placed in an autoclave and cured by heat and pressure. The patent states that a problem exists with trapped air that is not evacuated when the vacuum is pulled. In the method of Bascom, adhesive layer 12 and adhered layer 14 are placed in a vacuum, then the vacuum is released at the fluid temperature of the adhesive to allow trapped air to release.

Applicant submits that even if Bascom suggests to place upper and lower mouldings 11 and 12 of Rees within a vacuum with the solid film between, the combination still does not suggest to place a pressure intensifier against an exterior surface of the pre-form, pressing the pre-form against one of the pre-cured assemblies. As mentioned above, Scott cannot be combined with Rees in any feasible manner.

Claim 22 depends from claim 21 thus should be allowed. Claim 26 depends from Claim 24, requiring that a pressure intensifier be located in contract with an exterior surface of a leg of the pre-form to force the leg against the composite structure. As discussed above, there is no suggestion of how to utilize a pressure intensifier in connection with Rees. Rees does not have any exterior portion of a pre-form other than those portions located between the two mouldings.

Claim 18 was rejected over Rees in view of Bascom. Claim 18 depends from Claim 13. Even if the mouldings 11 and 12 of Rees are placed within a vacuum bag and heated, the

requirements of parent Claim 13 are not met.

Claim 38 requires that the pre-form be T-shaped, while Claim 39 requires that it be pi-shaped. The Examiner rejected these claims over Rees on the basis that the specific shape depends on the shape of the parts to be joined. Applicant respectfully submits that Rees teaches only to place a solid film between two abutting surfaces. Regardless of the particular shape of mouldings 11 or 12, they are joined along a single contact line. The solid film must necessarily be flat. Rees does not suggest joining two parts that are at an angle to each other, such as shown in Applicant's drawings. One viewing Rees would only be led to place a solid film of resin impregnated textile between the abutting edges. Rees does not suggest extending an exterior portion of a solid film alongside each of the parts being joined. One would not learn from Rees to utilize a T-shaped pre-form. One would not learn from Rees to utilize a pi-shaped pre-form. Claims 42 and 43 are similar to Claims 38 and 39, but depend from Claim 24. Applicant submits that these claims should also be allowed.

Claim 46 is a new claim, having many of the features discussed above. It requires a woven textile pre-form with a base and a pair of legs extending from the base at an angle, defining a slot between them. It requires inserting a structure into the slot, and placing another structure against the base, with additional adhesive films between the abutting surfaces. It requires pressure intensifiers, each having a corner portion in contact with the corners. It requires placing the assembly in a vacuum bag, evacuating the vacuum bag and applying heat. These features are not shown in Rees, Scott, or Bascom. The references do not show the use of a pre-impregnated, partially cured woven textile employed with a film of adhesive between two parts. The references do not show corner portions of a pre-form pressed against by pressure intensifiers.

It is respectfully submitted that the claims are now in condition for allowance and favorable action is respectfully requested. A check in the amount of $110 is enclosed for a one-month

extension of time. The Commissioner is hereby authorized to charge any additional fees, which may be required, or credit any overpayment to Account No. 50-0259 (0408RF.045513) Bracewell & Patterson.

Respectfully submitted,

Dec 31, 2002
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Version with Markings to Show Changes Made

13. (Three Times Amended) A method of forming a structural assembly, comprising the step of:

affixing a first pre-cured assembly to a 3-D woven textile pre-form impregnated with an uncured resin, [a] an adhesive film [adhesive] being located between said first pre-cured assembly and said pre-form;

affixing at least one additional pre-cured assembly to said 3-D woven textile pre-form[,] with an additional [film] adhesive film being located between said at least one additional pre-cured assembly and said pre-form; and

curing said resin and said adhesive films to form the structural assembly.

16. (Twice Amended) The method of Claim 13, wherein said step of curing is implemented [in an autoclave] with heat and pressure.

17. (Twice Amended) The method of claim [16] 13, wherein said perform has an exterior portion that is not located between said pre-cured assemblies, and pressure is applied with a pressure intensifier located [proximate to said pre-cured assemblies and] in contact with said exterior surface of said 3-D woven textile pre-form, the pressure intensifier pressing said exterior portion against a portion of one of said pre-cured assemblies.

18. (Amended) The method of claim [16] 13, wherein said step of curing is implemented [within a low temperature] by inserting said first and second pre-cured assemblies along with said pre-form and adhesive films into a vacuum bag, then evacuating the vacuum bag and heating the vacuum bag.

20. (Amended) The method of claim 16, wherein said pre-form has at least one exterior portion that is not located between said pre-cured assemblies, the method further comprising the step of applying a composite overwrap [plies] ply on said exterior [surfaces] portion of said 3-D woven textile pre-form.

21. (Amended) The method of C1aim [17]13 , wherein said [pressure intensifier comprises a flexible material that forces said 3-D woven textile against said first pre-cured assembly and said at least one additional pre-cured assembly] curing is performed by placing a pressure intensifier against an exterior surface of said pre-form that is not located between said pre-cured assemblies, inserting said first and second pre-cured assemblies along with said pre-form,adhesive films and pressure intensifier into a vacuum bag, then evacuating the vacuum bag, causing the pressure intensifier to press said exterior surface of said pre-form against a portion of one of said pre-cured assemblies, then heating the vacuum bag.

23. (Amended) The method of Claim 13, wherein said 3-D woven textile pre-form further comprises [at least one fiber woven through critical intersection zones] a base and a leg extending from said base at an angle relative to said base.

24. (Twice Amended) A method of forming structural assemblies with pre-cured laminated composite structures, comprising the steps of:

providing a woven textile pre-form with a base and at least one leg extending from the base at an angle, the pre-form being impregnated with an uncured resin;

affixing a first adhesive film [in] between a first pre-cured laminated composite [stuctures] structure and [a 3-D woven textile] the base of the pre-form [impregnated with an uncured resin];

affixing an additional adhesive film between at least one additional pre-cured laminated composite [structures] structure and the leg of said 3-D woven textile pre-form; [and] then

curing said adhesive films[, said first pre-cured laminated composite structures, said at least one additional pre-cured laminated composite structures] and said 3-D woven textile pre-form to form the structural assemblies.

26. (Amended) The method of claim [25] 24, [where] wherein the leg of said pre-form is not located between the composite structures, and pressure is applied during said curing step with a flexible pressure [intensifiers] intensifier located [proximate to said pre-cured laminated composite structures and] in contact with an exterior surface of said leg of said 3-D woven textile pre-form to force said leg against one of said composite structures.

27. (Amended) The method of claim [26] 24, wherein said step of curing is implemented [within a low temperature] by inserting said first and second pre-cured assemblies along with said pre-form and adhesive films into a vacuum bag, then evacuating and heating the vacuum bag.

29. (Amended) The method of Claim [26] 27, further comprising the step of applying a composite overwrap [plies] ply on said exterior [surfaces] surface of said 3-D woven textile pre-form.

32. (Amended) The method of Claim 24, wherein said 3-D woven textile pre-form further comprises at least one fiber woven through [critical] an intersection [zones] of said base and said leg.

38. (Amended) The method of Claim 13, wherein said 3-D woven textile pre-form is T-shaped.

39. (Amended) The method of Claim 13, wherein said 3-D woven textile pre-form is Pi-shaped.

42. (Amended) The method of Claim 24, wherein said 3-D woven textile pre-form is T-shaped.

43. (Amended) The method of Claim 24, wherein said 3-D woven textile pre-form has an additional leg extending from the base, defining a [is Pi-shaped] pi-shape.

45. (Amended) The method of Claim 13, wherein said pre-form has at least one exterior surface that is not located between the pre-cured assemblies, the method further comprising tapering [the edges] a thickness of the pre-form at an edge of said exterior surface of the pre-form.

New Claim

46. A method of forming structural assemblies with pre-cured laminated composite structures, comprising the steps of:

providing a woven textile pre-form with a base and a pair of legs extending from the base at an angle, defining a slot between them and corners at intersections of the legs and the base, the pre-form being impregnated with an uncured resin;

affixing a first adhesive film between a pre-cured laminated composite first structure and the base of the pre-form on a side opposite the legs;

inserting a pre-cured laminated composite second structure into the slot with additional adhesive films between inside surfaces of the legs and the second structure;

providing a pair of flexible pressure intensifiers, each having a corner portion, and placing the corner portion of each in contact with one of the corners formed by the base and the legs; then

inserting the first and second structures, along with the pre-form, adhesive films and pressure intensifiers into a vacuum bag; and

evacuating the vacuum bag and applying heat to cure said adhesive films and pre-form to form the structural assemblies.